ECBALLOCYSTIS RAMOSA f. *MINOR* BOURRELLY *et* COUTÉ, A RARE GREEN ALGA FROM INDIA

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ABSTRACT - *Ecballocystis ramosa* f. *minor* Bourrelly et Couté, a rare green alga collected from the Rajamala hills of Moonar in Kerala is reported for the first time from India. Interesting character like presence of polar nodular thickening is observed.

RÉSUMÉ - *Ecballocystis ramosa* f. *minor* Bourrelly et Couté, algue verte rare récoltée au Kerala dans les collines Rajamala de Moonar, est signalée pour la première fois en Inde. La présence de nodules polaires est observée.

KEY WORDS : Algae, Chlorophyta, Chlorococcales, *Ecballocystis ramosa* f. *minor*., India.

INTRODUCTION

The genus *Ecballocystis* was established by Bohlin in 1897 with the type species *E. pulvinata* (Iyengar, 1932). Fritsch (1918) added two more species, *E. ramosa* and *E. simplex* from South Africa. Iyengar (1932) collected many taxa of *Ecballocystis* from various parts of South India. This includes two new species, *E. fritschii* and *E. courtallensis*, two new varieties, var. *typica* and var. *pulneyensis* of *E. fritschii*, two new forms, f. *typica* and f. *jogensis* of *E. courtallensis* and three new varieties, var. *typica*, var. *minor* and var. *diffluens* of *E. pulvinata*. Bourrelly & Couté (1986) established a new form, *E. ramosa* f. *minor* from Réunion island.

The genus *Ecballocystis* was originally ascribed to Chlorodendraceae, Tetrasporales (Iyengar, 1932). Iyengar (1932) however, pointed out its similarities with *Oocystis*. Philipose (1967) considered it to be a member of Chlorococcales. Bourrelly (1966, 1988) included it in the family Hormotilaceae of the order Chlorococcales, but Bourrelly (1972) included it in the family Palmellaceae of the order Chlorococcales. Komarek & Fott (1983) included it in the family Botryococcaceae of the order Chlorococcales.

The absence of zoospore production was the main criteria for including the genus under the order Chlorococcales (Bourrelly, 1988). Bourrelly &

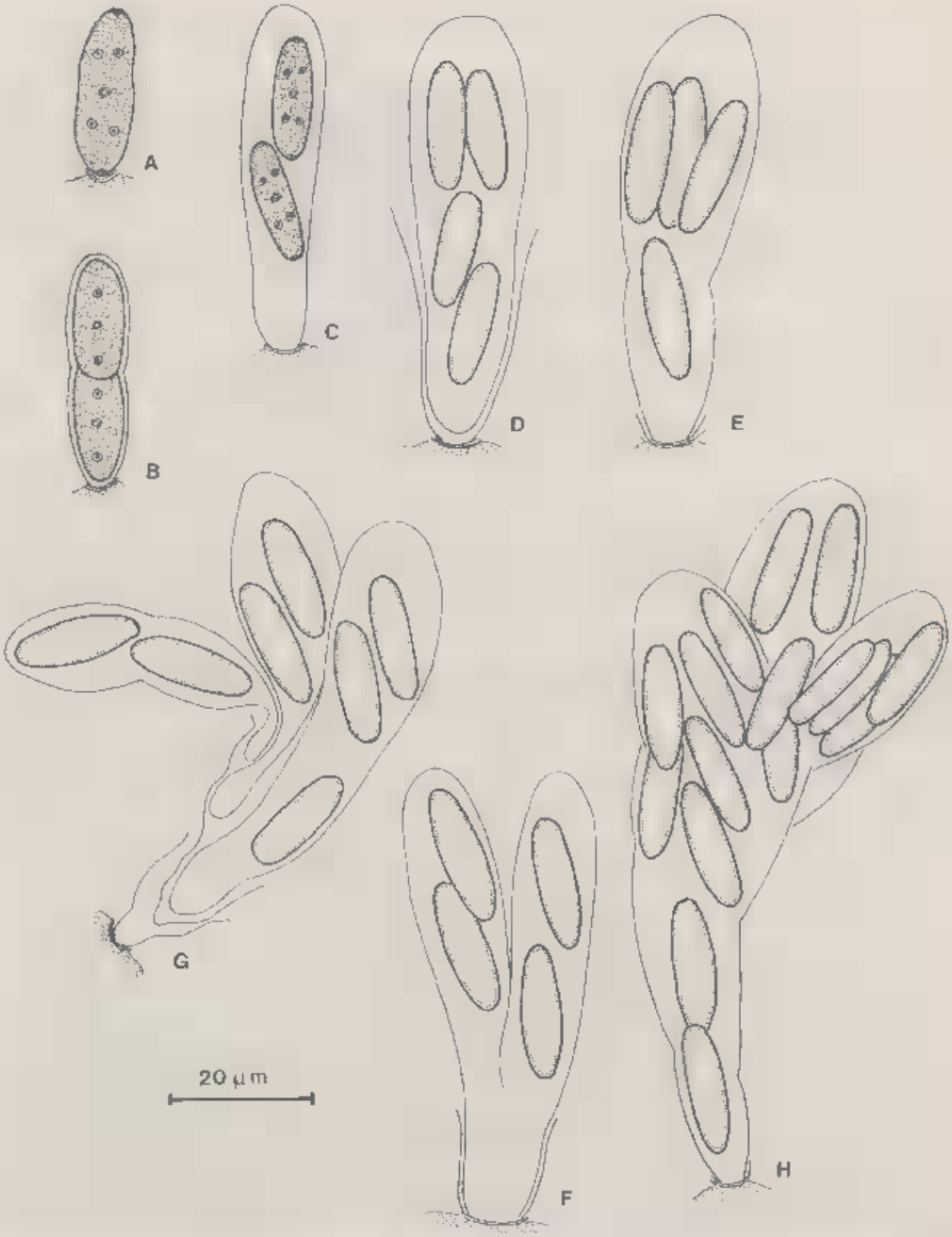

Fig. 1 A-H: *Echallocystis ramosa* f. *minor* Bourrelly et Couté.- A: single cell attached to the substratum by its conical end with a conspicuous mucilaginous pad also showing the nucleus, chloroplast, pyrenoids and polar nodular thickenings. B: recently divided colony with two cells. C: two celled colony. D, E: four celled dendroid colony with different mode of arrangement of autospores. F: showing branching. G et H: dendroid colonies showing highly branched appearance.

Couté (1986) included it in the order Tetrasporales of the family Dictyosphaeriaceae. Here it is included in the family Hormotilaceae of the order Chlorococcales following Bourrelly (1988).

Ecballocystis is a freshwater genus mostly found in the mountain streams or rivers with rocky beds or near waterfalls either as lithophytes or epiphytes rarely detached free floating.

MATERIALS AND METHODS

The authors collected a species of *Ecballocystis* from a small mountain stream, at an altitude of about 5000 feet of Rajamala hills of Moonar in Idukki district of Kerala. The collection was done by scrubbing the rock surface. The material was preserved in 4% formaldehyde for further study.

OBSERVATIONS AND DISCUSSION

The plants were found to be growing in the cool stream water along with *Zygnema* and some members of Cyanophyceae and Bacillariophyceae. The water temperature was 17°C. Since the plants are very minute, the authors could not ascertain from the field whether they are truly lithophytic. Since the collection is mostly done by scrubbing the rock surface and since the colonies under the microscope are seen free with a free mucilaginous pad or attached to some filamentous algae, it is considered here as lithophytic or epiphytic.

Isolated single free cells attached to the substratum are observed (Fig. 1A). In colonies cells may be in two, four or in multiplies of four. Rupturing of the parent cell wall is not of frequent occurrence. Mostly cells are found in dendroid colonies, sometimes having a branched appearance (Fig. 1 F-H). The colonies are attached to the substratum by a mucilaginous pad. Iyengar (1932) observed that the cells which are loose exhibit polarity, i.e. one end of the cell is broadly rounded and the other end slightly conical. He suggested that the cells are attached to the substratum by their conical end. The present observation confirm this view (Fig. 1A). Iyengar (1932) based his observations on *E. ramosa* on the South African material supplied to him by Fritsch. He observed that the cell contents of *E. ramosa* and *E. fritschii*, a new species established by him, are quite similar. The cells contain a central nucleus with 2 or 4 parietal plate like chloroplast. The chloroplasts are delicate light green and are closely crowded. A small lamellated polar nodular thickening is present in mature cells as observed by Fritsch (1918). Iyengar (1932) observed such polar nodular thickenings in *E. courtallensis*. The present specimens are smaller than the *E. ramosa* described by Iyengar. The maximum cell length of the present taxon is 23μm, whereas it reached upto 48μm in Iyengar's specimens. Bourrelly & Couté (1988) established a new form, *E. ramosa* f. *minor*, which measured 10-15μm x 4.5-7μm. This taxon is established based on its less dimensions and weak plastids. From the diagram of Bourrelly & Couté (1986) it appears that the parent cell wall is wavy and no mention is made about the polar nodular thickening. *E. ramosa* is distinguished from all other species of *Ecballocystis* by colony being a small dendroid branched system, plate like chloroplast, cell division usually into four, occasionally into eight and the position of the ruptured old mother cell wall. The present alga showed variation in the cell structure and

dimension from the type. But it showed close similarities with the new forma established by Bourrelly & Couté (1986). Considering the similarities exhibited by the present taxon to *E. ramosa* f. *minor*, the present algae is considered to be the same and is treated here as *E. ramosa* f. *minor*, which is a new report for India.

Ecballocystis ramosa Fritsch f. *minor* Bourrelly *et* Couté
Fig. 1 A-H. Bourrelly & Couté 1986. p. 97. Plate IV, Fig. 7.

Thallus microscopic forming two to many celled generally branched dendroid colonies. The whole colony is attached to the substratum by a prominent mucilaginous pad. Cells in the colony usually in the multiples of two. Cells elongate, cylindrical with rounded or slightly conical ends, 12-23μm long, 4.4-7.6μm broad, with a central nucleus with two or four parietal plate like chloroplasts, each with a small pyrenoid, lamellated polar nodular thickenings seen in mature cells. Reproduction is by autospores. Autospores are formed in each cell by the division of the cell contents into four.

Habitat: On rocks splashed by a mountain stream in Rajamala hills of Moonar in Idukki district of Kerala, India. C. N° K. 51.

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